

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Improvements in or relating to Locking Devices for the Nuts of Adapter Sleeves for Rolling Bearings

We, AKTIEBOLAGET SVENSKA KULLAGER-FABRIKEN, a Corporation organised under the Laws of the Kingdom of Sweden, of 17, Artillerigatan, Goteborg, Sweden, do hereby  
5 declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention is for improvements in or relating to locking devices for the nuts of adapter sleeves for rolling bearings.

Rolling bearings are frequently mounted on adapter sleeves having internal cylindrical  
15 surfaces and external tapered surfaces, which sleeves are split along their whole length. The small end of the tapered surface is provided with a screwthread on which is screwed a nut by means of which a bearing having a tapered  
20 bore can be forced along the tapered surface of the sleeve thus compressing the sleeve to make it fit tightly onto the shaft. In order to lock the nut in position and prevent it from coming loose, it is well known to use a locking  
25 washer having an annular body provided with an inwardly directed tongue for engaging an axial slot in the sleeve and a number of outwardly directed tongues of which one is bent into engagement with a wrench slot in the outer  
30 periphery of the nut after the nut has been tightened, thus locking the nut.

If the adapter sleeve is comparatively thick, the above described locking device functions quite satisfactorily because the inwardly directed tongue will securely grip the walls of the  
35 slot. If, however, the thickness of the sleeve is decreased in order to make it possible to decrease the size of the bearing relatively to the diameter of the shaft, and if the screwthreads are of  
40 greater outer diameter than the small end of the tapered part of the sleeve, certain inconveniences may be encountered which will be explained hereinafter and which it is an object of the present invention to avoid.

45 According to the invention, there is provided  
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a locking device for the nuts of adapter sleeves for mounting rolling bearings on shafts, in which the adapter sleeve has an outer tapering surface with a screwthread at the small end of said taper having an outer diameter greater  
50 than the smallest outer diameter of the sleeve, and in which a nut screwed onto the screwthread is locked relatively to the sleeve by an annular locking washer mounted on the sleeve at the smallest outer diameter thereof and having  
55 a plurality of tongues on its outer periphery for engaging slots in the nut, which locking device is characterised by the provision of a pair of opposed tongues on the inner periphery of the washer for engaging slots in the sleeve, the  
60 distance between the ends of which tongues is less than the smallest outer diameter of the sleeve but at least as great as the bore diameter of the sleeve, whereby the washer will be centered by the shaft. 65

The invention will now be described in connection with the accompanying drawings in which:—

Figure 1 is an axial section through a sleeve of conventional type with a bearing mounted  
70 thereon,

Figure 2 is a corresponding section through a thin sleeve with a locking device according to the present invention and with a bearing  
75 mounted on the sleeve,

Figure 3 is an end view of a sleeve according to Figure 2 with a locking washer of ordinary type and showing the washer eccentrically displaced, and

Figure 4 is an endview of a sleeve with a  
80 locking washer according to the present invention.

Like reference numerals indicate like parts throughout the drawings.

In Figure 1 a bearing 2 is shown mounted on  
85 a shaft 1 by an adapter sleeve 3 which has an internal cylindrical surface 4 which fits the shaft and an external tapered surface 5 fitting the tapered surface of the bore of the bearing. The small end of the sleeve is provided with a  
90

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screwthread 6 onto which a nut 7 is screwed. A locking washer 8 is provided for locking the nut in position. This washer has an inwardly directed tongue 9 which engages a slot 10 in the sleeve and a number of outwardly directed tongues 11 of which one is bent aside to engage one of the wrench slots 12 after the nut has been tightened. The construction shown in Figure 1 is well known.

10 In Figure 2, the sleeve 3 is so thin that the diameter of the screwthread 6 must be made greater than the diameter of the small end 13 of the tapered outer surface of the sleeve. Before the sleeve is slipped onto the shaft 1 it is inserted in the bearing by compressing it to a smaller diameter which is made possible by the fact that the sleeve 3 is slit in an axial direction along its whole length. As it is necessary to be able to pass the washer 8 either over the thread 6 or over the big end of the tapered sleeve 1 it follows that its inner diameter must be greater than the diameter of that part 14 of the sleeve which is located between the thread 6 and the small end of the tapered part of the sleeve. When the washer has been put in position it is therefore possible for it to assume a position in which it is eccentric relative to the sleeve, as shown in Figure 3. In this position the tongue 9 either does not engage the slot 10 at all or engages it only slightly. The washer cannot therefore carry out the function for which it is intended, i.e. to lock the nut.

This defect is avoided in carrying out the present invention by the fact that the washer, as shown in Figure 4, is provided with two internal opposed tongues 9 the ends 15 of which are located at a distance from each other which is less than the smallest external diameter of the sleeve but at least as great as its bore diameter. Actually, in Figure 4, the inner ends 15 of the two internal opposed tongues 9 are at a

distance from each other which is only slightly greater than the bore diameter of the sleeve. From this Figure, it is apparent that the washer 8 in this case is centered by the shaft through the tongues and is diametrically located by the engagement of the tongues in the slots 10. It cannot assume an eccentric position. If the ends of the tongues are located at a distance from each other which is less than the smallest external diameter of the sleeve, at least one of the tongues 9 will always engage the corresponding slot 10 in the sleeve.

It is to be understood that the invention is not restricted to the precise constructional details set forth.

What we claim is:—

1. A locking device for the nuts of adapter sleeves for mounting rolling bearings on shafts, in which the adapter sleeve has an outer tapering surface with a screwthread at the small end of said taper having an outer diameter greater than the smallest outer diameter of the sleeve, and in which a nut screwed onto the screwthread is locked relatively to the sleeve by an annular locking washer mounted on the sleeve at the smallest outer diameter thereof and having a plurality of tongues on its outer periphery for engaging slots in the nut, characterized by the provision of a pair of opposed tongues on the inner periphery of the washer for engaging slots in the sleeve, the distance between the ends of which tongues is less than the smallest outer diameter of the sleeve but at least as great as the bore diameter of the sleeve, whereby the washer will be centered by the shaft.

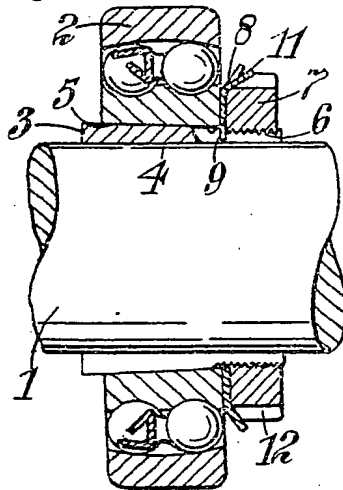
2. The adapter sleeve nut locking device substantially as described with reference to Figures 2 and 4 of the accompanying drawings.

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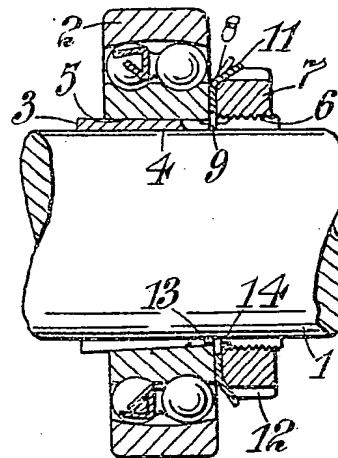
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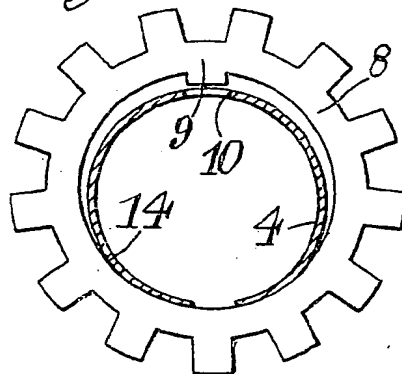
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Fig. 4.*

